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AMERICAN INDIANS AND EDUCATIONAL LABORATORIES.

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MANY OF THE DIVERSE EDUCATIONAL PROBLEMS OF THE AMERICAN INDIAN HAVE BEEN IDENTIFIED FOR YEARS, BUT HAVE BEEN PERMITTED TO LAY DORMANT. SOCIO-ECONOMIC DISADVANTAGEMENT IS EXHIBITED IN AREAS OF INCOME, UNEMPLOYMENT, SCHOOL DROPOUT RATE, EXPECTED LIFE SPAN, INFANT MORTALITY RATE, BIRTH RATE, AND HEALTH HISTORY. COMMUNICATION PROBLEMS BLOCK THE TEACHING-LEARNING EFFORT. THE SOCIAL SCIENTISTS' INTEREST IN ACCULTURATING THE INDIAN INTO THE AMERICAN NORM IS SEEN AS BEING FOCUSED UPON THE CHILDREN - THOSE WHO CAN LEAST RESIST IT. EFFORTS BY FIVE REGIONAL EDUCATIONAL LABORATORIES ARE DIRECTED TOWARD SOLVING SOME OF THE IDENTIFIED PROBLEMS. NEEDS REMAINING TO BE MET INCLUDE TECHNOLOGICAL DEVELOPMENT, COMPENSATORY INNOVATION, SUBJECT COVERAGE, CROSS-CULTURAL SENSITIVITY FOR TEACHERS, INFORMATION CARRY-OVER, EVALUATION, SEPARATING EDUCATION FROM ETHNOCENTRISM, AND CORRELATING SCHOOL AND HOME LIFE. SINGLE FREE COPIES OF THIS DOCUMENT ARE AVAILABLE FROM SOUTHWESTERN COOPERATIVE EDUCATIONAL LABORATORY, INC., 117 RICHMOND DRIVE, N.E., ALBUQUERQUE, NEW MEXICO 87106. (SF)

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COVER DESIGN: Pen-and-ink rendering by Art Bailey, Laboratory artist, of photograph of an elementary school student from Cochiti Pueblo, New Mexico.

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AMERICAN INDIANS AND EDUCATIONAL LABORATORIES

By Willard P. Bass and Henry G. Burger

Publication No. 1-1167

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117 Richmond Drive NE
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FOREWORD

This monograph on the current situation, American Indians and education, is an outgrowth of the presentation by the national system of educational laboratories made in Washington on October 5 and 6, 1967. Hence the monograph presents a broader picture than SWCEL and its work with the Indians of that four-state region.

It is hoped that the monograph will serve the purpose intended: to call attention to some objective data related to the Indian education problem and perhaps, at the same time, to generate more interest in the solution of some of the problems described. Many problems of Indian education which have been fairly well identified for years have been permitted to lie dormant. It is encouraging that now much work is being started in this and other vital areas of education. Perhaps a publication like this may contribute to further work on the problems described or implied.

Several members of the SWCEL laboratory staff contributed to the publication. Especially to be mentioned are Dr. Burger and Mr. Bass, principal authors and editors. Among the others were Drs. Stanley Caplan, Paul Liberty, and Mavis Martin; Mr. Guy Watson and Mr. Wilburn McClintock were responsible for preparing the graphics for the report.

Paul V. Petty, Director
Albuquerque, New Mexico

October 31, 1967

AMERICAN INDIANS AND EDUCATIONAL LABORATORIES

Summary:

A most deprived but least visible member of the great society is the American Indian. The United States' educational system traditionally favored and favors the "Yankee" or "Anglo" culture rather than American Indian.

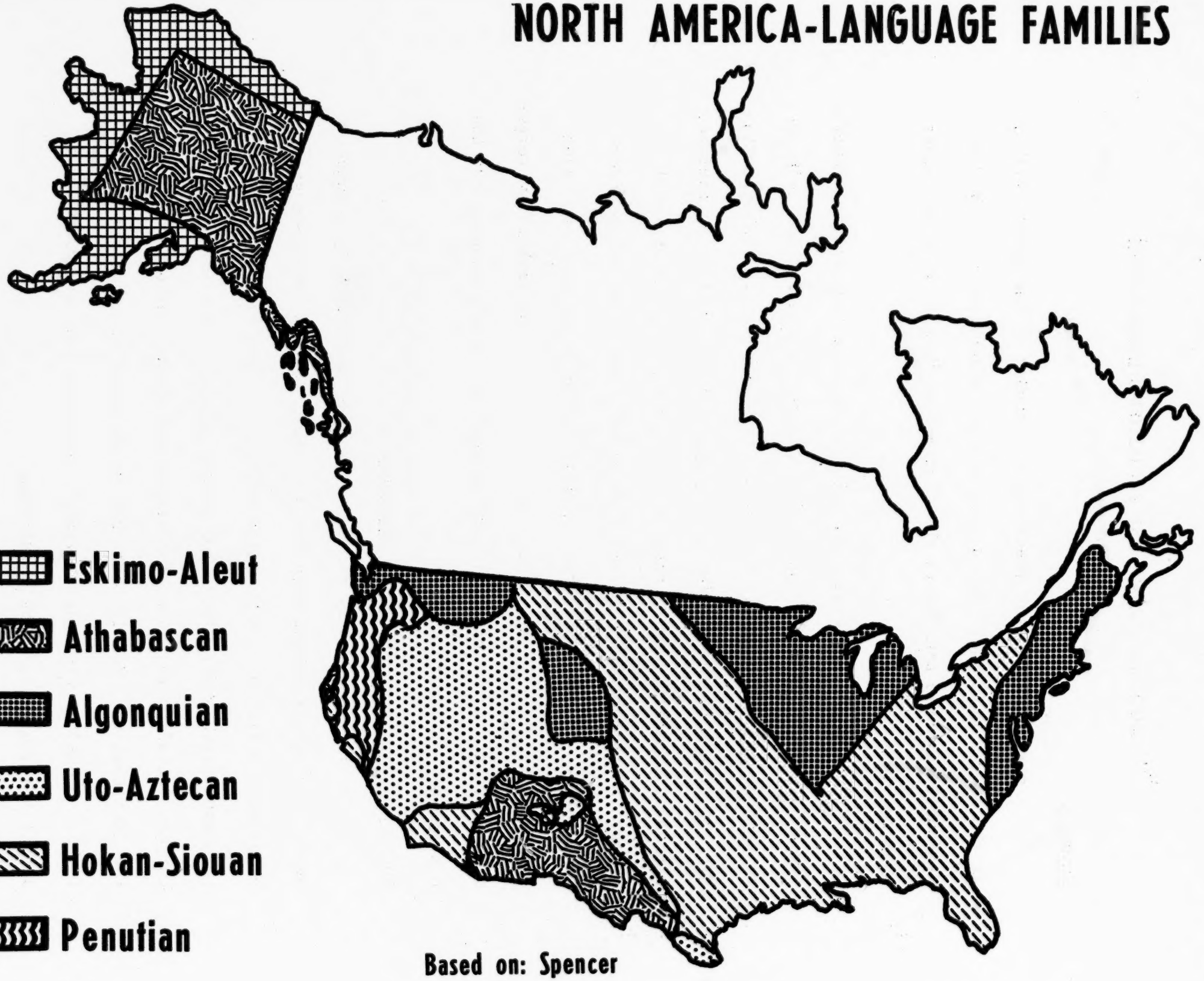
The recently federally-established Regional Educational Laboratories offer a basic opportunity for researching and perhaps helping to correct this situation. Several Regional Educational Laboratories are now attacking the problem with pilot programs (not to be confused with mass dissemination of results). One of these, the authors' group, is developing a program to strengthen American Indian understanding and pride of heritage, improve bilingual skills, and teach teachers bi-culturalism. These represent one of the rather few large-scale attempts in American history at applied social science; but the discipline has barely begun.

Indian Diversity Amidst Anglo Homogeneity

The middle class of the United States is relatively homogeneous. It speaks essentially one language, English, and enjoys relatively a single polity, a federal government that has been reasonably stable for almost 200 years. Middle class Americans -- largely including the educationists -- may therefore tend to neglect the fact that the "Melting Pot" has by no means melted ethnic minorities. Indeed, sociological evidence suggests that minorities and stratification may even be increasing.

This article deals with only one of those many minorities,

NORTH AMERICA-LANGUAGE FAMILIES



Based on: Spencer

Figure 1

NORTH AMERICA–LANGUAGE FAMILIES

Eskimo-Aleut

Aleutian

Eskimoan

Athabascan

Northern Athabascan

Southwestern Athabascan (Navajo-Apache)

Californian Athabascan (Tolowa-Hupa)

Algonquian

Wakashan

Salishan

Algonquian

Californian Algonquian (Yurok-Wiyot)

Plains Algonquian (Arapaho-Cheyenne)

Uto-Aztecan

Ute

Tanoan

Zunian

Kiowian

Aztecan

Hokan-Siouan

Siouan

Caddoan

Muskogean

Iroquoian

Yuman

Californian

Keresan

Penutian

Sahaptan

Californian

Tsimshian

Based on: Spencer

Figure 2

1966 SCHOOL ENROLLMENT OF INDIAN PUPILS BY GEOGRAPHIC DISTRIBUTION

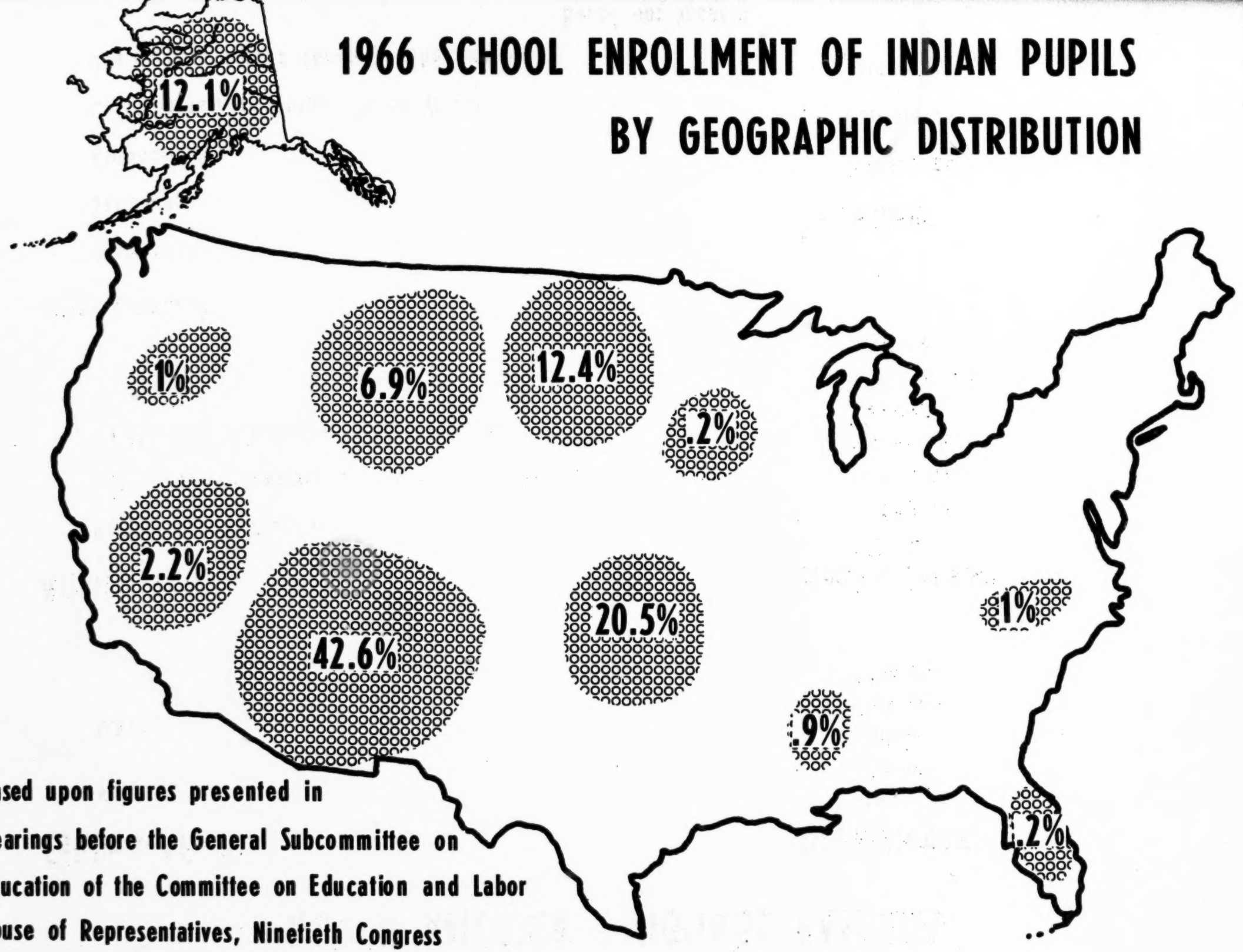


Figure 3

Based upon figures presented in
Hearings before the General Subcommittee on
Education of the Committee on Education and Labor
House of Representatives, Ninetieth Congress
June 28 and 29, 1967, page 398

Total 100%

that one which is perhaps most different and exotic from traditional Yankee -- the American Indian. (In accordance with Bureau of Indian Affairs nomenclature, "Indian" includes Eskimo.)

The difficulty of Indian education may be seen, first, in the fact that the American Indian is not a homogeneous unit. Indeed, the concept of the American Indian is a very recent one, an amalgam offering certain political advantages. Culturally, however, American Indians are a most diverse group. Merely considering the broad categories of Indian languages, the United States has six major groups, as shown in Figure 1. Within these major language groupings are many sub-languages (Figure 2) and cultures, most of which are unintelligible or barely intelligible to other Indian occupants of the "same" language area.

The Indians of Oregon and California alone speak over 25 different families of language (Gleason, 1961, Page 475).

In fiscal year 1966, the schooling situation of Indians aged 6 to 18 was as follows:

Number	Type of Schooling
141,694	In school (public, federal day, federal boarding, mission, other).
7,757	Not enrolled in school.

(Note: These figures do not include the 9,000 students over 18 years of age, nor adult education.)

These Indian students are, however, by no means distributed equally throughout the United States. Instead, they are highly concentrated, especially in the Southwest, as shown in Figure 3.

THE PLIGHT OF THE INDIAN

SOURCE: Education Age, April, 1967

	Indians	General Population
MEDIAN FAMILY INCOME	$1,500	$6,882
UNEMPLOYMENT RATE	45%	4.6%
AVERAGE SCHOOLING FOR ADULTS	5 years	11.7 years
AVERAGE LIFE EXPECTANCY	63.5 years	70.2 years
INFANT MORTALITY RATE (Per 1,000 live births)	35.9	24.8
INCIDENCE OF TUBERCULOSIS (Per 100,000 pop.)	184	26.6
AVERAGE SCHOOL DROP-OUT RATE	50%	29%
BIRTH RATE (Per 1,000 pop.)	43.1	21.0

Figure 4

Thus, the Indians, who once occupied the entire sub-continent of the United States, are now essentially located in the Rocky Mountain area and in Alaska, with the greatest concentration occurring in the Southwest. While the general population trends evermore toward urban clusters, the Indian favors the very areas that are least visible: the Rocky Mountain West and its rural, even desert regions.

The Socio-economic Disadvantage of the Indian

The story of Anglo contact with Indian is one of retreat by the latter, step by step, into conditions which are summarized briefly. The Indian is compared with the general U. S. population in Figure 4.

Thus, in many important categories of daily life, the Indian is at a disadvantage as compared with the general population. His income is only two-ninths as much. His unemployment rate is almost ten times greater. His school dropout rate is almost double. He has less than half of the schooling. He enjoys some seven years less of life. Half again as many of his infants die. Tuberculosis strikes seven times as many people. His birth rate is about double.

We must not, however, take these statistics too literally, for they involve certain value judgments. It is industrialism, not Indian culture, that considers a high birth rate a disadvantage, and that so organizes work and market-system payment as to define employment and unemployment.

The Anglo child's home life includes from infancy both materials and activities and simultaneous naming of them. But the disadvantaged are denied both the associated sensory-motor activities and the symbols for them. In this connection, Jean Piaget has shown how early percepts

and cognitions are associated into later concepts (Kamii and Radin, 1967). Hence the disadvantaged infant's lag is parlayed by the accelerated enculturation that is formal schooling.

Thus, equal educational opportunities for individuals are lacking by reason of race, color, religion, or national origin in public educational institutions of all levels in the United States. Recently the United States Office of Education issued a comprehensive examination of educational opportunity in the United States, the so-called Coleman Report. As part of this report, entitled "Equality of Educational Opportunity," the Commissioner listed certain statistics showing the educational achievement of various minority groups.

The Indians were one such ethnic minority covered in this report. The tests that were reported did not purport to measure intelligence, attitudes, or qualities of character. Furthermore, the tests were not intended to be "culture free." The report concedes categorically that the tests given were "culture bound." They measured skills that are most important in our society for getting a good job and moving up to a better one, and for full participation in an increasingly technical world. Consequently, a pupil's test results at the end of the public school provide a good measure of the range of opportunity open to him as he finishes school. He has a wide range of choice of jobs or colleges if these skills are very high, a narrow range that includes only the most menial jobs if these skills are very low.

The overall test results shown in the report "Equality of Educational Opportunity," revealed sharp differences for different racial and ethnic groups. The report clearly shows that the degree of

educational disadvantage at the end of twelve years of high school, for those who remain in school that long, is very large.

The disadvantage shows most clearly for reading comprehensive and verbal ability. In twelfth grade verbal ability the Indian scores tend to be almost one standard deviation below that of the majority. This means that about 85% of the Indian scores are below the average of the majority, versus only about 50% of the whites.

In some cases, notably verbal ability, at the twelfth grade level, the Indians' median score is almost at the lowest quartile of the majority test scores. Indians in the first grade were found to lag in nonverbal test scores by only 1.1 standardized test points but they lag in verbal (i.e., English, not Indian languages) by a significant 5.4 test points. By the twelfth grade, furthermore, the lag in achievement reached 4.9 points for nonverbal and 8.4 points for verbal. Twelfth grade scores were also obtained to show the relative standing of Indians versus the majority of the population in reading, mathematics, and general information. These appear in Figure 5.

It might be thought that the superiority of the national norm is due merely to geographical rather than ethnic differences. After all, it is well known that certain sections of the country, notably the Northeast, have higher taxable school bases, a better educational-sociological network, etc. Yet, the lag cannot be attributed to mere geography. We may compare the traditionally leading sector of the U.S., the Northeast, with the Anglo group that is otherwise closest to the American Indians, rural Southwest. We find that the Southwestern

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* Scores are presented as standard scores with a mean of 50 and a standard deviation of 10.

NATION WIDE MEDIAN TEST SCORES FALL 1965

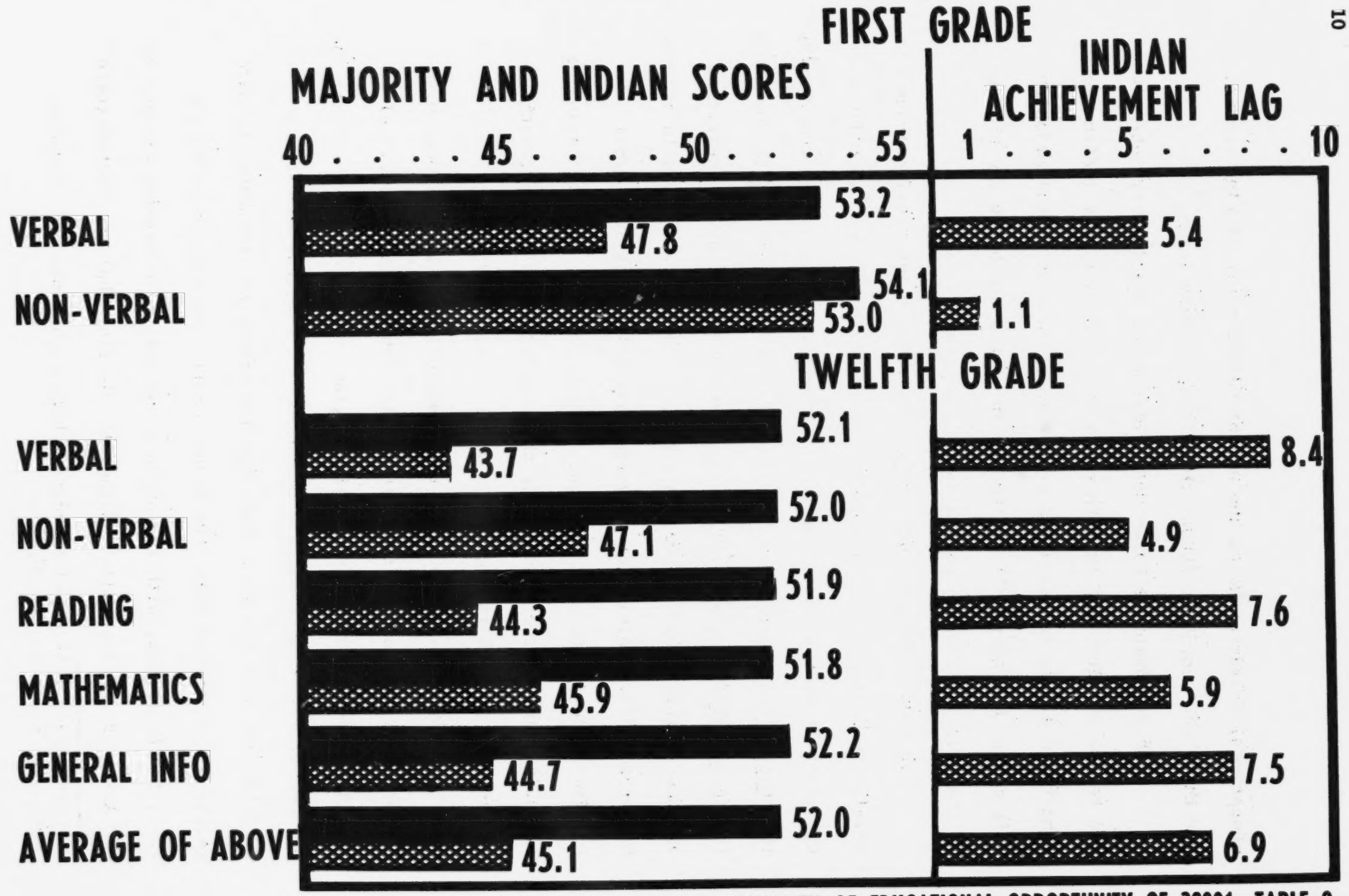


Figure 5

SOURCE: EQUALITY OF EDUCATIONAL OPPORTUNITY OE 38001, TABLE 9

These scores are presented as standard scores with a mean of 50 and a standard deviation of 10.

Anglo group scores quite close to the Northeast, whereas the Indians living nearby score very far down, as shown in Figure 6.

These data demonstrate that the Indian pupil and adult have a tremendous disadvantage in participating in what is called the American way of life. The student leaves our schools at a tremendous disadvantage. The disadvantaged adult stems from a disadvantaged student.

The result is a vicious cycle: Rural isolation and low income= cultural disadvantages in middle-class school. They cause low parental aspirations for their child in school. The low level of parent education restricts the help parents are able to give the child in school. The language of home is in conflict with the language of school. The minority students experience a high failure and dropout rate.

Indian Problems Conceptualized as Communicative Interference

It is easy, when considering either under-achievement or cultural deviation, to find correlational evidence to suggest almost anything as a concomitant problem or influence. Yet, in certain ways, these children present a unique segment of the total school population, particularly in questions of relationships between school, family and community. They have lived for generations within a small radius of their present habitation. Traditional customs and languages prevail for most, even today. They are often retained with fierce pride and no apology. The strong influence of the primary and extended-family group and the close-knit community has been felt, and incorporated to an amazing degree, by generations of these youngsters. This is true regardless of questions of utility of such training or impact of other concurrent educative influences.

GRADE LEVEL LAG OF WHITE RURAL SOUTHWESTERN AND INDIAN STUDENTS AS COMPARED WITH STUDENTS LIVING IN NORTHEASTERN UNITED STATES

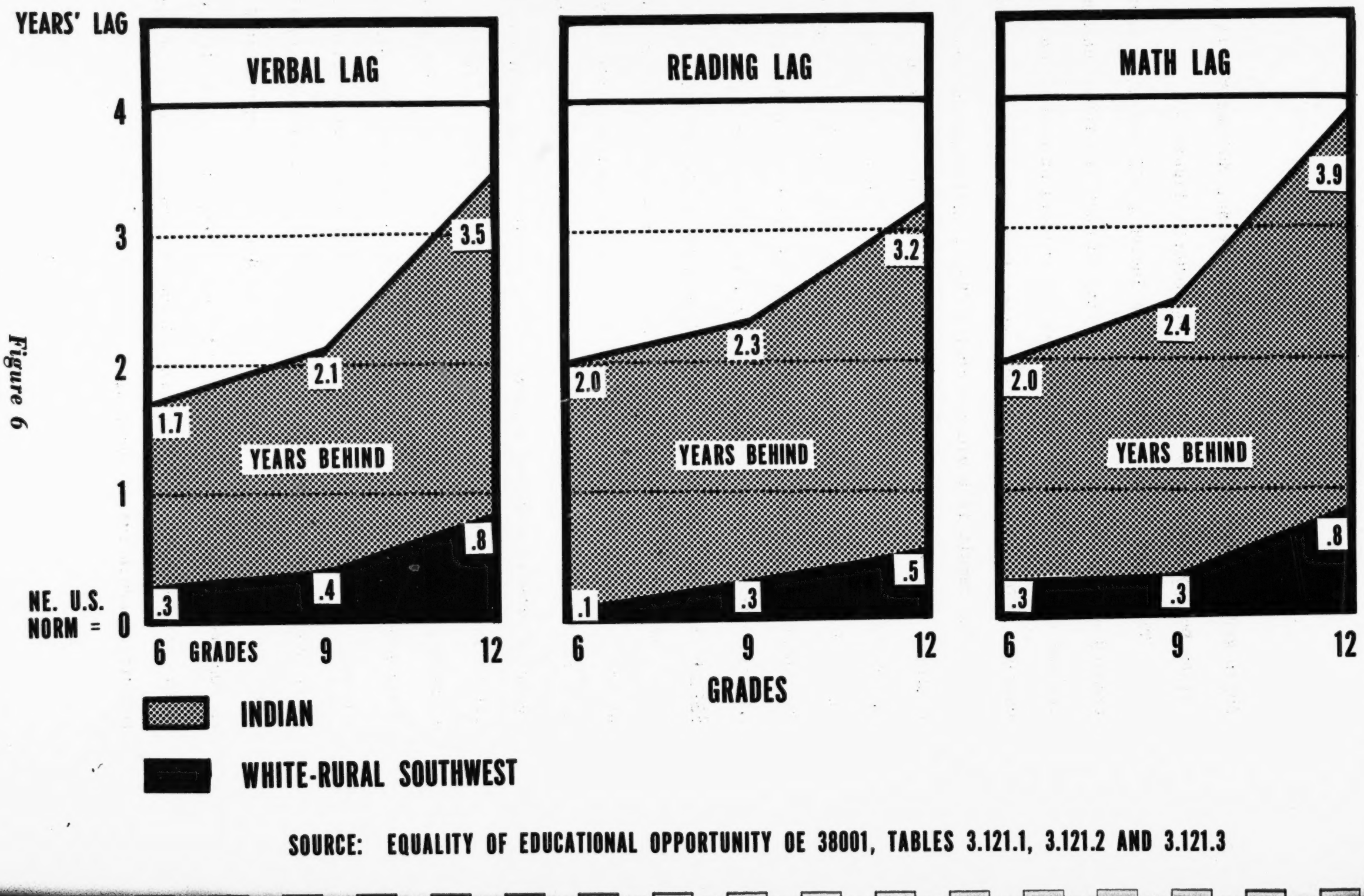


Figure 6

SOURCE: EQUALITY OF EDUCATIONAL OPPORTUNITY OE 38001, TABLES 3.121.1, 3.121.2 AND 3.121.3

Yet the optimal learning/teaching environment is one in which free flowing two-way communication exists. In any educational environment, the leader, either through his direct efforts or through some form of mediation provides stimuli to the student. If the channel is clear, the student receives the stimuli, interprets or decodes the teacher's input, and forms a response. The response is received and evaluated by the teacher. He in turn decides what the next stimuli or message will be, and so on. In this fashion, learning progresses through the grades.

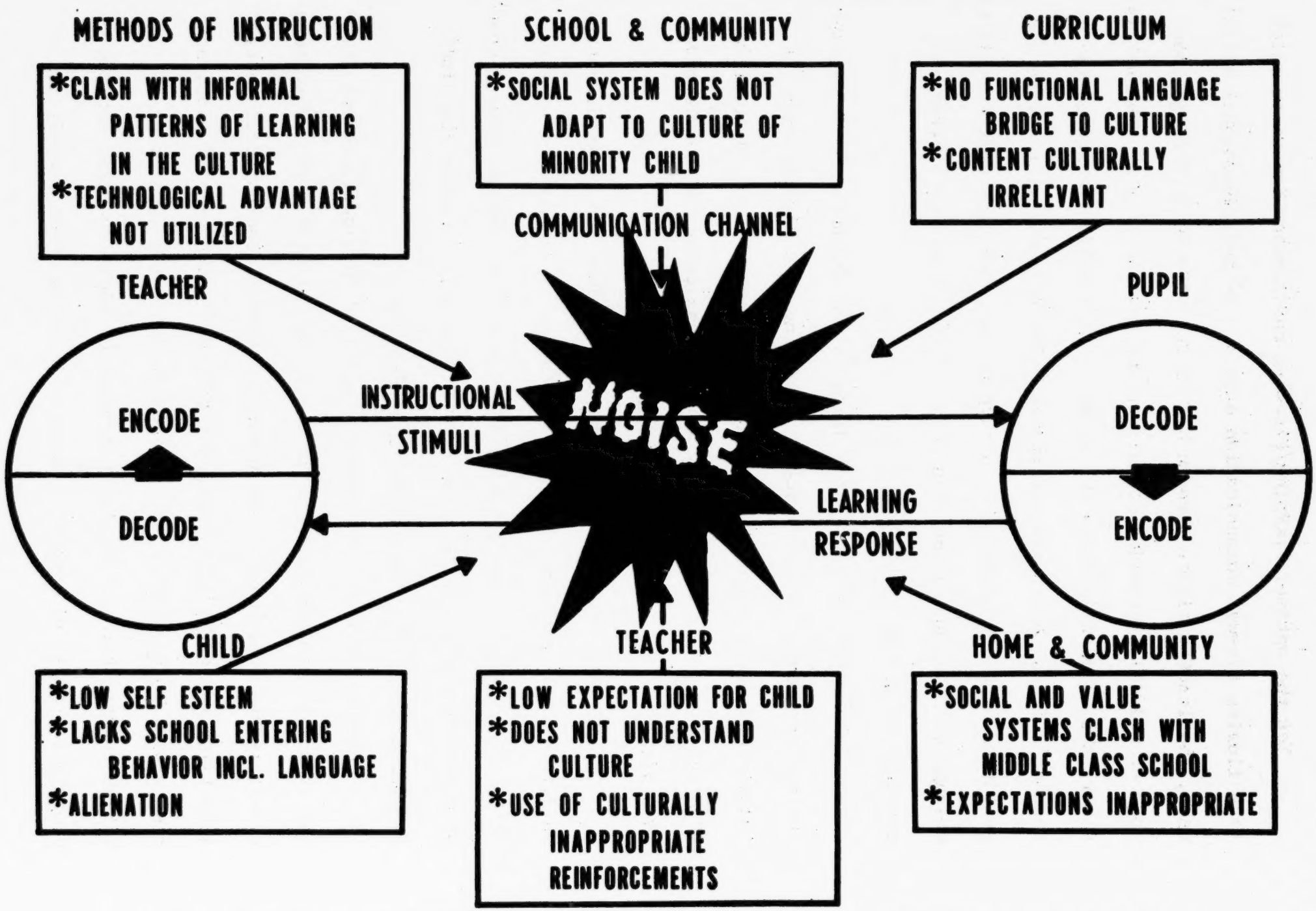
But "noise" in many forms disrupts the channel. For some, the "noise" is minor, like thoughts of a fishing trip blotting out the teacher's message. But for the Indian the "noise" is so disruptive that the channel is closed and communications cease to be effective. This situation is diagrammed in Figure 7.

These are some of the factors that produce the communications failure. These problems emanate from the total environment of the child, not just from the school curriculum. What can be done to combat them and open up minority group communications, and hence learning?

The Pressure to Operationalize Social Science

Minority groups have always fascinated the social scientist. Yet large-scale attempts to befit their special need have been a relatively recent phenomenon. The planning of "directed cultural change" (sometimes called telesis) suggests that some persons will plan, and others will be planned. This concept clashes with several basic Yankee values, such as the Puritan ethic of individualism, and the democratic spirit of equalitarianism. Today, however, we witness

ACHIEVEMENT IS GREATEST WHEN CHANNEL IS CLEAR
BUT "NOISE" BREAKS DOWN COMMUNICATION FOR THE CULTURALLY DIVERSE STUDENT



COMMUNICATION = ACHIEVEMENT SUCCESS IN ACADEMIC, SOCIAL, ATTITUDES & SELF DIRECTION

Figure 7

a revolt against "rugged individualism" and the material concept of Economic Man.

There was formerly a belief that the integration of culture prevented the maneuvering of any one of its sectors alone, and hence it would be theoretically impossible to maneuver the culture. Today, such "futilitarianism" is disappearing (Burger, 1967, especially Chapter 3). There is emerging a facet begun a century ago, but dormant almost entirely since--the sub-discipline of applied anthropology. Its readiest target is the segment of the populus which the culture both wishes to change, and which cannot politically prevent itself from being changed. We refer, of course, to children. The education of the young is, in the truest sense, directed cultural change (Skinner, 1955-56, pages 287-289; cf. page 244). The democracy discourages the "hidden persuasion" of directed acculturation toward adults, yet encourages it toward children. The explanation may lie in a single fact: Children may not vote.

Because the Indian so grossly violates the bourgeois norm, his incorporation into the Great Society becomes a test. It is a test of whether the U.S.A. is a system ("Americanism") that can proselyte any human into fellowship, or whether it is merely one temporal pattern ("Yankeeism") that is self-limited to middle-class white Anglo-Saxons. If it is the latter, it is likely to flare but a moment in the Toynbeean reel that is history.

Today's burst of educational research can be estimated from the size of such periodicals as Research in Education (U.S. Office of

Education). Furthermore, many projects go on with funds provided otherwise:--Merely in the field of non-USOE educational research on the American Indian, there is a wide range of projects, typified by the two dozen current schemes summarized in Appendix 1.

The Establishment of Applied Social Science

Perhaps the major new institutional venture of education in the U.S.A. is the establishment of Regional Educational Laboratories. Twenty such regional groups were established in 1966 under Title IV of the federal Elementary and Secondary Education Act. Together, these non-profit corporations, distinct from universities, cover all fifty states; our Southwestern Cooperative Educational Laboratory serves the area of Arizona, New Mexico, West Texas, and Oklahoma. Each Laboratory is governed by a board of directors whose membership consists of representatives from the public schools, private schools, colleges and universities, state departments of education, and business and cultural institutions of the region. Coordination is ensured by the Division of Educational Laboratories of the U.S. Office of Education. Thus, the Laboratory is sponsored both by the federal government, the state governments, and private groups (Ripley, 1967, page 7). Entree is thereby facilitated to all levels and types of institutions.

Five Laboratories are concentrating on the educational problems of the Indian: Southwestern Cooperative Educational Laboratory, headquartered in Albuquerque; Far West Laboratory for Educational Research and Development, Berkeley; South Central Region Educational Laboratory, Little Rock; Southwest Educational Development Laboratory, Austin; and Upper Midwest Regional Educational Laboratory, St. Paul. Because of the concentration of ethnic groups mentioned earlier (28.5% of all

Indian students, for example, living in the Navajo Reservation alone), our Southwestern Cooperative specializes in cross-cultural problems, especially Indian and Spanish-American.

The current programs of the Regional Educational Laboratories directed toward the American Indian student as a special student population group are aimed at solving some of the identified problems listed earlier. We design programs to improve the inadequate concepts of self which the Indian student brings to school with him and which, in many cases, is reinforced by the school system and by the work-world which follow it. A second group of programs is directed toward improving the limited language skills with which the students enter school, and which may account for the high attrition rate and the falling achievement scores. Still other programs are designed for teachers to improve psycho-social or cultural sensitivity toward those factors in Indian culture which may be at variance with the culture of the prevalent middle class school. The modalities of these programs are diagrammed in Figure 8.

Needs Remaining to be Met by Laboratories

Because of the newness of the Laboratories, it must be obvious that all of the projects and accomplishments described to date are but a very small measure of what is intended by the Congress and other constituting authorities. Consequently, a principal need is the implementation of all the foregoing programs, which are barely begun. In addition, we here spell out a few of the more specific needs that we feel are remaining. Our sequence will be from the most obvious and concrete problems to the broadest, most strategic, and most subtle needs.

ACHIEVEMENT IS GREATEST WHEN CHANNEL IS CLEAR

THE LABORATORY PROGRAMS ATTACK THE "NOISE" AND OPEN THE COMMUNICATION CHANNEL

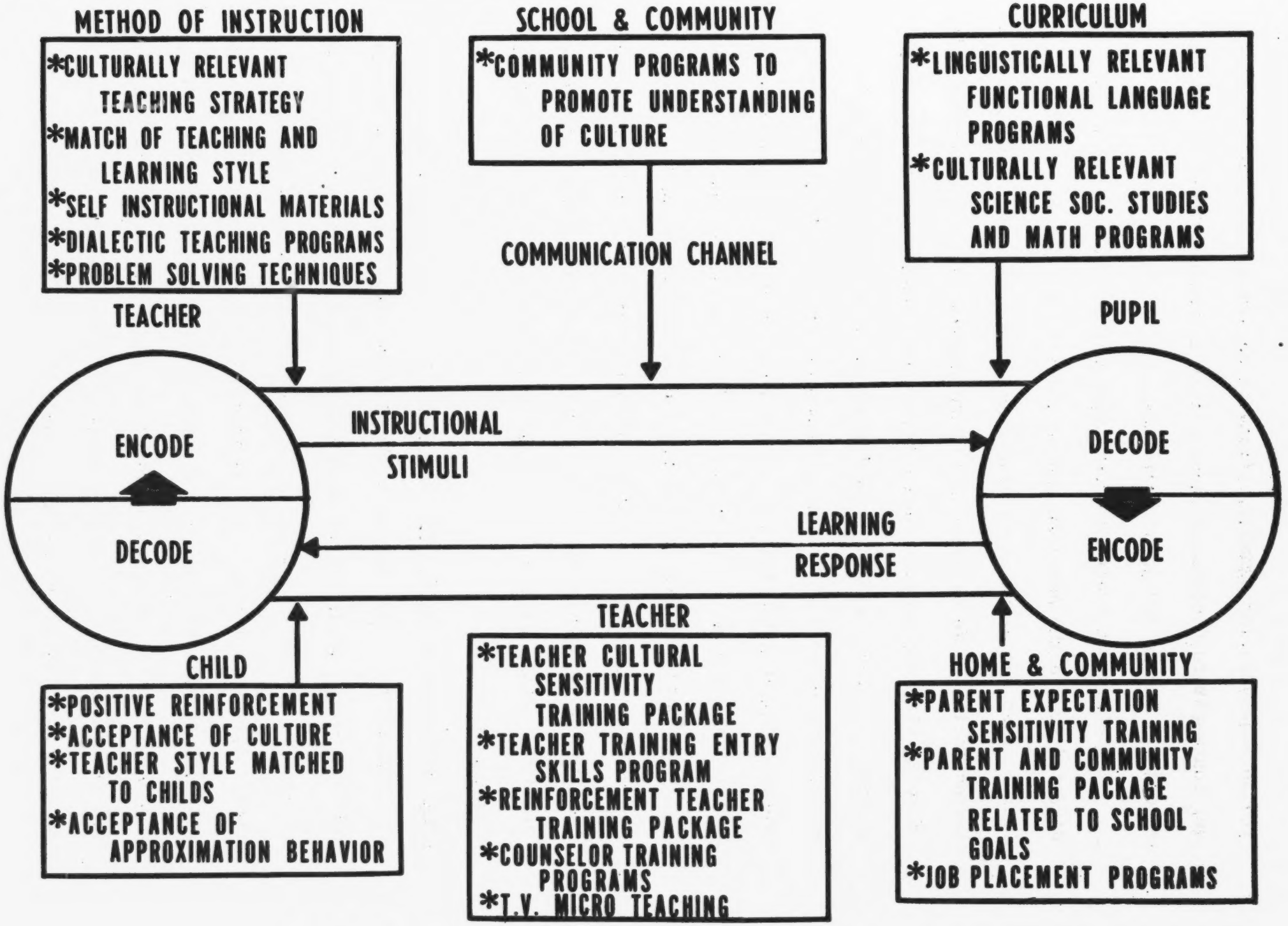


Figure 8

Technological development. Among the obvious and easily defined problems remaining is the introduction of the new technology, such as audiovisual equipment and computerized programmed learning, to the target populations. The examples just cited (such as computerization) are the extreme modern cases. In fact, much simpler equipment, such as record players for language records, are probably needed in many of the target schools.

Compensatory innovation. A somewhat related need concerns not the technology itself but the locus of the introduction of the newer methods. Because of the phenomenon called "secondary acculturation" (Burger 1967: 126-29), any social structure tends to intensify itself. Consequently, dominant groups tend unconsciously to favor themselves through budgetary, sociological, and other phenomena, as diagrammed in Figure 9.

The result in our own case is that, if it were not compensatorily checked, the benefits of the innovations would tend automatically to go to the groups already highest in the social scales--Anglo (rather than Indian and the other minority target groups). Consequently, the Laboratories must constantly make an effort to spread the benefits of their programs geographically and socially to the less obvious areas.

Subject coverage. A similar disproportion danger, and future need, concerns the subject matters of the program improvements now being designed. Our Southwestern and the other Indianist Laboratories have touched only a very small number of subject areas, particularly language arts. There are a number of important subjects which have scarcely been influenced, such as the natural sciences and mathematics.

ANY SOCIAL STRUCTURE TENDS TO INTENSIFY ITSELF WITH BENEFITS UNCONSCIOUSLY GOING TO THE MAJORITY GROUP

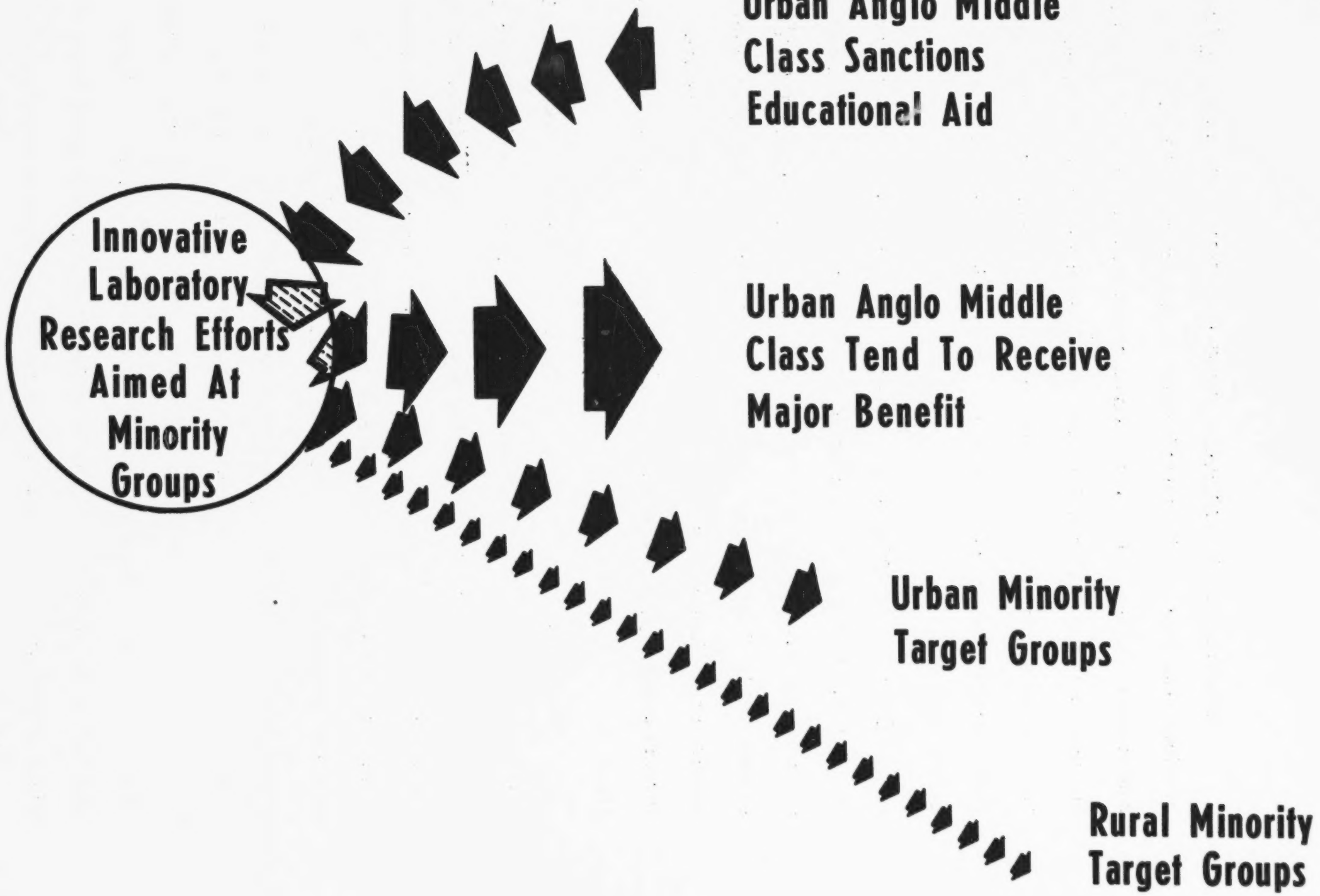

Innovative Laboratory Research Efforts Aimed At Minority Groups
Urban Anglo Middle Class Sanctions Educational Aid
Urban Anglo Middle Class Tend To Receive Major Benefit
Urban Minority Target Groups
Rural Minority Target Groups

Figure 9

Cross-cultural sensitivity for teachers. Not only must the Laboratory programs aid the pupils of these subjects, but the entire area of teacher sensitivity has barely been touched. It is one thing to draw up lesson plans which will aid the teacher in imparting specific skills and knowledge of certain items. It is a more difficult task to make the teacher sensitive to the basic attitudes of life by the cultural minorities he is trying to teach. In the long run, it may be necessary to prepare guide books concerning each ethnic group for study by teachers and/or pupils. These guide books would give the teacher a cultural background and insight into the ethnic group, and would not attempt to teach any specific substantive matters, such as mathematics.

In this connection we find a beginning in a new course to teach students (not yet to teach teachers) being done for the Sioux Indians. The creator of this course is John F. Bryde. Dr. Bryde has designed a course called Acculturational Psychology. In it, Sioux students, using a makeshift workbook, in turn discuss each Sioux value, contrasting it with the white value. For example, a part of one lesson contrasts the Anglo value of acquisitiveness (the desirability of working for one's own benefit) with the old-time Sioux value of sharing or generosity.

Here is just one beginning of one textbook for one group (Sioux students). The same idea should be carried not only to Sioux but all other cultures, not only to students but to teachers. Not only is literature needed for analysis of the cultural differences, but also creative suggestions as to how it may be syncretized with modern values in the larger American culture surrounding these students.

De-skilling teacher functions. A related problem is to find a method of obtaining sufficient teachers for these additional duties. Since the country faces such a great shortage of teachers, it becomes obvious that the Laboratories will not only have to develop these teacher skills, but then find ways of breaking down the skills, or "de-skilling" the values. For example, virtually nothing has been done in methods to separate teaching of substantative matters, such as mathematical formulas, from the role of the teacher as a second mother figure, a tender-loving-carer. Yet it may well be that in our specialized society there will develop separate types of teachers, particularly to solve the ethnic problems of frustration and goallessness, where the affectional values become so important. Similarly, only a small beginning has been made in applying substitute teacher methods, such as the Laubach method of each-one-teach-one, or even self-instruction methods like the programmed texts. These devices are only beginning in middle-class Anglo schools. A vast gap remains to spread them into the culturally disadvantaged groups with which the Laboratories are greatly concerned.

Evaluation of effectiveness. There always remains the problem of standardization of evaluation of effectiveness of all innovations. This is, of course, the entire area of management procedures, such as the rapidly developing concepts of PERT. These management procedures are not only mass (statistical) but also individual. That is, with the use of computers and other modern techniques, we can simultaneously find averages and identify the needs of individual students.

Information carry-over. A related need which will plague us for

some years to come is the problem both of retrieval and of dissemination of information. The essence of this problem, it presently seems, is to codify the research results. At present, and traditionally, they typically codify by input topic, such as the ethnic target (Navajo Indians, for example, are filed under the letter N). Also in use are such well-known systems as Dewey Decimal (cf. Cutter), Library of Congress, Human Relations Area Files, Psychological Abstracts, etc.

Yet these are of limited generative potential. For a vicious cycle limits output to the same categories as filed. However, this totally disregards the possibility of finding analogies by scientific principles underlying many target areas. For example, we should think that certain problems in translating cultural concepts into visual devices, as for videotapes, would be common to many cultures. As far as we know, very little has been done on devising classification techniques and number systems for the scientific principles themselves. Furthermore, many individuals and institutions in the U.S. and around the world are attacking problems which bear on these types of programs. We consequently consider a major function of our Laboratory to be the coordination and dissemination of such information, and not merely the initiation of our own programs.

Separating education from ethnocentrism. As we continue to raise the level of remaining problems, we come to the crucial problem of ethnocentrism: To what extent can scientists be free from the cultural biases in which they themselves grew up? Can any test, whether intelligence tests, attitudinal tests or otherwise, truly reflect a standardizable quantity? Can there truly be fair comparisons

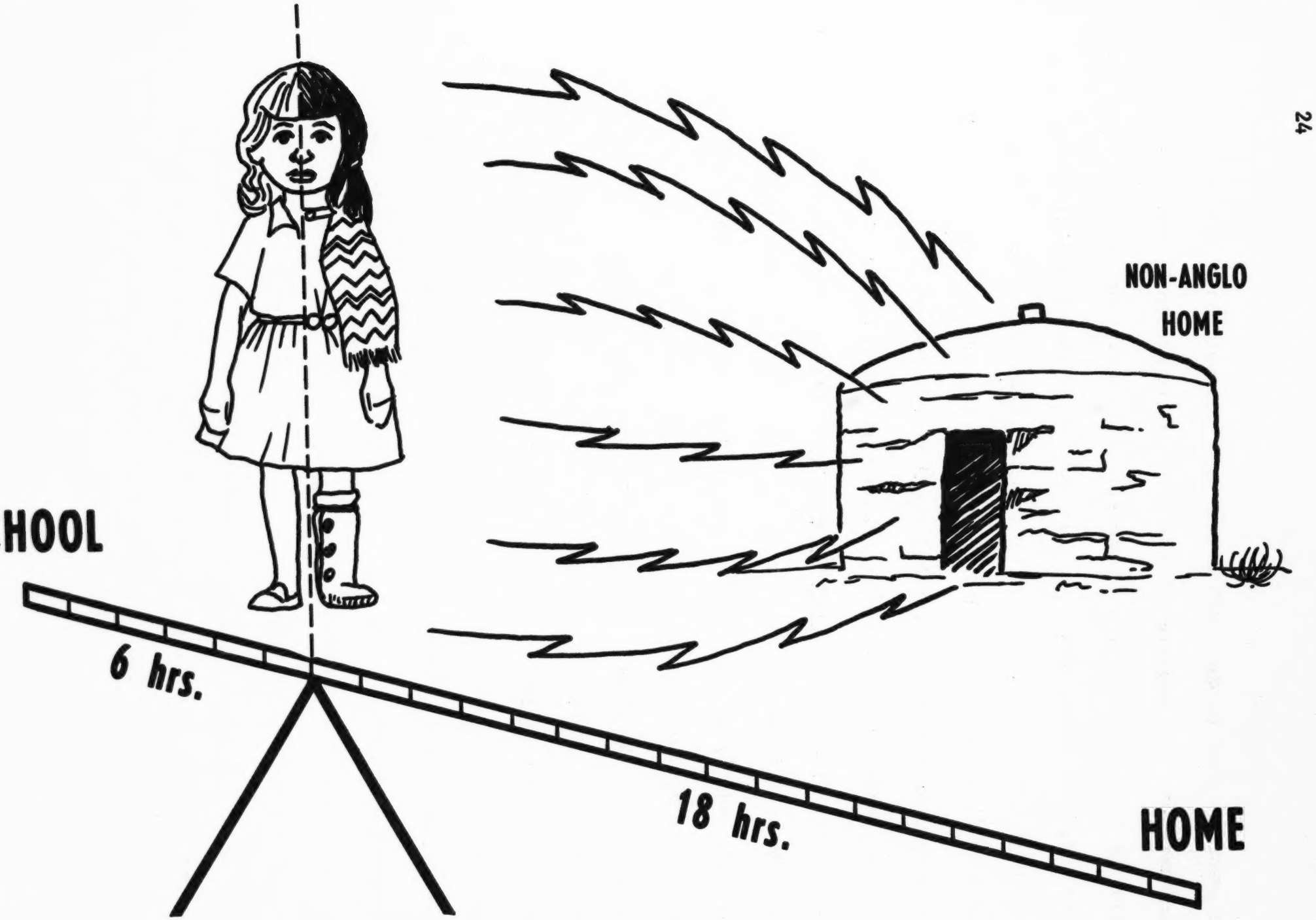

NON-ANGLO
HOME
SCHOOL
6 hrs.
18 hrs.
HOME
THE SPLIT CHILD
The Child is Alternately Influenced by Home and School Environments

Figure 10

between Anglo values and, for example, Indian values? Is it justifiable that we should teach our minority groups to become quasi-Anglos? This issue deals, of course, both with the testing procedures, and with the larger purposes of education. Because of the newness of the educational involvements with such social sciences as cultural anthropology, the Laboratories have given little strategic thought to the longer range purpose of these curricula. If, for example, there can be found suitable types of employment and cultural satisfaction in methods which are not fully Anglo, but which retain Indian elements, then there would be no point in trying to adjust the Indian school child toward becoming merely another Anglo. In other words, there may yet remain many curricular possibilities which would be intermediate between Anglo and Indian, rather than, as at present, a goal of making the minority seemingly an imitation Anglo.

Correlating school and home life. This leads us into the broader problem of pupil motivation. If the parents of the child remain in a minority culture and minority values, to what extent can we expect that the few hours the child spends in school each day will really influence his life and his values? Surely the division between the Anglo type schooling and the traditional type home life of many families makes peculiar the situation of the school child, who feels a division or split between the two cultures. His education then seems highly irrelevant to his insistent needs. There is no holism between school and community, as is diagrammed in Figure 10.

Here again, the Laboratories have only touched on the subject. We have been spending most of our effort on the school day, and

virtually disregarding the home life, which is the majority of hours in the day, and to which the school child presumably brings his new skills. The entire problem remains, then, of environmental holism.

Creative solutions not mere test reports. And a final, even broader, problem remains for the Laboratories to tackle. This is the problem of translating description of needs into creative solution of needs, prescription. Most traditional social science effort, has gone into the definition of problems and bench marks, rather than into their solution.

If we may translate this problem into medical terms, it would be as if physicians were to spend most of their time in diagnosing patients, and little of their time in prescribing. Obviously, this would be only a part of their problem.

True, we need to determine bench marks--that is, description of the personality and social situation of these minorities. But bench marks must prod us to solutions. There remain many obstacles. For example, let us suppose that the Laboratories identify a correlation between school success and family nuclearity. That is, suppose we find that the family having the larger extended kinship (resident in or near the home) tends to be the family which has the poorer student in school. By no means can we then merely recommend idealistically that the home life be changed and that the grandparents be sent away! In other words, description does not lead to prescription. There is always a gap between applied science and implementation, according to Henry S. Hatfield's law of implemental innovation (Agassi, 1966, page 361). The difficulties of institutionalizing bridges for this gap

help explain why engineering flourished in Europe as a profession for some two centuries before becoming correlated with pure-science theories. Then another gap appears as we try to correlate from natural (i.e., sub-social) to social science. Theory is inadequate; an entire range of "ethological" disciplines remains to emerge and existing institutions may be, once again, perpetuating the disproportion.

Thus, the federal government obligated science research funds in fiscal 1966 as follows:

	Basic Research	Applied Research
Social sciences	2.1%	2.9%
Non-social sciences	97.9	97.1
Total	100.0%	100.0%

(Source: U.S. HEW 1967, Page 160)

This entire area of "Hatfield" implementation is the area of social engineering. It has barely been touched in our democracy. Applied social science, which is the essence of Laboratory work, is quite a virgin field. Not only is social science understaffed, but virtually all of its practitioners are teaching in schools. There they repeat and develop theories, but pay very little attention to the application of these theories. Even the principles of organizing for applied social science are quite virginal. For example, some laboratories, including our own, are beginning to find that a line-and-staff organization may be a superior way to apply social science. That is, the better scientists may perhaps be utilized to advise on all operational projects, and the administrators of those projects may better be

operational (and "less scientific") people. We cannot say for sure at this early time. We would only indicate that there is a dearth of information and of practice in applied social science.

Educational Behavioral Science Needs Sustained, Not Sporadic, Support.

Educational laboratories are, then, in about the same situation in social science as physical-science laboratories were perhaps a century ago. At that time, only a few laboratories were being set up for specific ends such as Thomas Edison's Menlo Park Laboratory (designed to develop electrical and aural devices such as the phonograph). Yet even physical science, involving fewer elements than social science, took years of perfection before it could develop both devices and human organization to operationalize them. We know, for example, that it took World War II before the idea of large-scale applied physical science was found highly practical, as in the atomic engineering investigations. Billions of dollars of priority and endeavor were funded before important results were found. Educational laboratories, involving the relatively untapped field of applied social science, cannot be expected to produce such miracles after just two years of operation.

Summary of Remaining Needs.

We must, in sum --

1. Make a sustained effort to spread rather than concentrate the benefits of our problems.

2. Gradually improve all subjects, and not merely language arts.

3. Offer training, and especially guidebooks, to help teachers understand the cultures of each minority group.

4. Identify and specialize the many nonintellectual functions

of teachers, such as tender loving care.

5. Devise prototype data retrieval system that will enable Laboratory findings to be retrieved by their essential scientific principles (processes, not merely substances).

6. Seek for teaching goals that blend Anglo values and the values of the minority group, rather than forcing the minority group into a purely Anglo pattern.

7. Translate the description of needs we are finding into creative solutions for these needs.

These, then are the issues and directions on which the educational laboratories must act if we are to improve the conditions of the Indians--and other Americans.

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APPENDIX I

The following list of typical current non-U.S.O.E. research projects, either completed within the past six months or now in progress, is offered as representative of current Indian education research interest. This list has been compiled largely from a summary of such research presented by Dr. William Kelly in a paper delivered at the National Research Conference on American Indian Education, Pennsylvania State University, May 25, 1967.

1. Father John F. Bryde, Holy Rosary Mission, Pine Ridge, S.D.

   Psychological experiments with curriculum and teaching methods leading to development of a secondary school course to give the Sioux Indian student a conscious awareness of his traditional tribal culture and values as a basis for adjustment in biculturalism.

2. George P. Castile, University of Arizona.

   A description of the history and existing patterns of relationship between members of the community and the Navajo Demonstration School at Rough Rock, Arizona.

3. Center for Applied Linguistics, Washington, D.C.

   A study of ten boarding and four day schools operated by the Bureau of Indian Affairs to determine needs and develop recommendations for English language teaching programs for American Indians.

4. James R. Clark and Lyal Holder, Brigham Young University.

   A study for the development of a program of teacher education in Indian education, a project in translating educational materials into the languages of Indian groups, and a study in public schools relative to peer group and community relationships between Indian

and non-Indian students and parents as these relationships affect academic and social achievements of Indian students.

5. Le Roy Condie, University of New Mexico.

   A project in the development of a sequential series of curriculum materials in the social studies for Navajo Indian pupils in grades K-12.

6. Enki Corporation, San Fernando, California.

   Evaluation of a number of Bureau of Indian Affairs projects such as: TESL on the Navajo Reservation; enrichment of the educational program in the Choctaw Agency Area; an elementary guidance program in the United Pueblos Agency Area.

7. EVCO, Inc., Albuquerque, New Mexico.

   A study of the effectiveness of the use of films, prescribed daily by computer techniques on the basis of tested concept deficiencies, as a means of filling in existing gaps in the cultural continuum of the Indian child.

8. Robert Gentry, University of Oklahoma.

   Experiments in the effectiveness of workshop training in securing attitude changes among public school teachers of Negro and Indian children.

9. Theodore Graves, Joseph Powers, and Byran Michener, University of Colorado.

   A study designed to secure data on a number of socio-cultural and psychological variables for approximately 1000 male high school Indian seniors and to test the relationships of these variables and both the students' classroom performance and post graduate success.

10. Joel Greene, Harry Saslow and Mary J. Harrover, New Mexico Highlands University.

A multi-purpose,dormitory centered project concerning the psycho-social adjustment of students in an Indian boarding school and involving research, research and development, in-service training, and service for personnel and students.

11. Arthur M. Harkins, University of Kansas.

A study of public education on a Minnesota Chippewa Reservation describing the community and school life from the viewpoints of major participants in the life of these institutions.

12. Judith Holt, Brigham Young University.

A study of the relationship between ACT scores and achievements of Indian students at Brigham Young University.

13. Inter-Laboratory Committee on Indian Education Claremont Hotel, 1 Garden Court, Berkeley, California.

A project to develop eight experimental and demonstration schools in Alaska, Montana, North Dakota, South Dakota, New Mexico, Arizona, and Washington, where promising curriculum, teaching methods, and administrative practices will be developed and incorporated to serve as models for the improvement of education of Indian children.

14. William H. Kelly.

A study of the Indian school age population of Southern Arizona to identify the more crucial economic, social, linguistic, and personality factors related to low academic achievement among Indian students.

15. Myles McConnon.

A project to develop a bilingual education program for Taos primary children which will include instruction and drill in the sound values of both English and Indian, using the International Phonetic Alphabet reduced to simplified phonetic systems for both languages.

16. Charles K. Ray and Frank Darnell, University of Alaska.

Studies of personal characteristics and traits predictive of success in teaching Alaskan "bush" schools, teaching patterns and factors lending themselves to improved teacher training, and the development of appropriate teaching materials.

17. Rough Rock Demonstration School, Chinle, Arizona.

An experiment in various aspects of Indian education for children and adults, and in Indian involvement in, and control of, a community school.

18. Bernard Spilka, University of Denver.

A study of achievement, educational adjustment and alienation among 7-12 grade Sioux designed to measure and analyze a number of social and psychological variables related to possible combinations of school performance and alienation.

19. George D. Spindler and Louise Spindler, Stanford University.

Case studies in culture and personality factors related to Indian education. These studies are part of a long term program the Spindlers have engaged in, or have encouraged others in, of "building a body of careful empirical cases of educative process in the socio-cultural milieu, and their functional analysis."

20. Carolyn Steel, Brigham Young University.

A study of the relationship of cultural background to academic achievement of Indian students at BYU which will identify some specific cultural problems which lead to academic difficulty.

21. Southwestern Cooperative Educational Laboratory, Inc., Albuquerque, New Mexico.

A longitudinal study, funded by the Bureau of Indian Affairs, which measures achievement gain of a sample of 3,500 high school Indian students in over twenty schools in seven states and seeks to investigate the relationship between achievement and certain social, economic, linguistic, and personality variables.

22. Murray Wax, Rosalie Wax, and Mildred Dickeman, University of Kansas.

A study of education of American Indians in rural and urban schools in northeastern Oklahoma which will measure and describe the educational consequences of isolation and the development of pupil peer societies.